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Reply to Office action of Mar. 21, 2007

REMARKS/ARGUMENTS

Claims 1-4, 6-21 and 23 remain pending. Claims 1, 10 and 21 are currently amended, and Claim 6 is cancelled. Applicants respectfully request reconsideration in light of the following remarks.

Rejection of Claims 1-4, 6-21 and 23 under 35 U.S.C. 112

Claims 1-4, 6-21 and 23 are rejected under 35 USC 112, first paragraph, as the term "status process control (SPC)" does not have support in the specification. Applicants accordingly correct the term to "statistical process control (SPC)" in Claims 1 and 21, which has support in the specification, for example, the last paragraph on page 8.

Claims 1-4, 6-21 and 23 are rejected under 35 USC 112, second paragraph, as "status process control (SPC)" and "determining whether the new control chart is a new trend chart" are indefinite.

Per "status process control (SPC)," this term has been corrected to "statistical process control (SPC)" in Claims 1 and 21, as described above.

Per "determining whether the new control chart is a new trend chart," Claim 6 is merged into Claim 1 to further clarify the new trend chart by reciting that "which is a control chart that has not been

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previously used on tools of a type that is associated with the new control chart." It is believed that the term "new trend chart" and the limitation are now definite. Claim 21 is similarly amended.

Rejection of Claims 1-4, 6-21 and 23 under 35 U.S.C. 101

Claims 1-4, 6-21 and 23 are rejected under 35 USC 101 because the claimed invention is directed to non-statutory subject matter, and there is no useful tangible results.

Accordingly, Applicants amend independent Claim 1 to explicitly recite a post-computer activity "applying the SPC control charts for monitoring production in manufacturing," which is supported by the originally filed specification (for example the last paragraph of page 2), and thus no new matter is added. It is respectfully believed that such limitation constitutes a practical application, therefore rendering the claimed invention statutory.

Regarding another independent Claim 21 as previously presented, it is believed that the step "generating an alarm" recites a post-computer activity and constitutes a practical application, therefore rendering the claimed invention statutory.

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Rejection of Claims 1-4, 6-21 and 23 under 35 U.S.C. 102(e)

Claims 1-4, 6-21 and 23 are rejected under 35 USC 102(e) as being anticipated by Shi (US Patent 6,839,713). Applicants respectfully traverse the rejection for the following reasons.

I.

With respect to one aspect of the claimed invention in Claim 1, it is determined "whether the changed information is describable by at least one of the plurality of SPC control charts" as claimed. Specifically, as illustrated in the embodiment in the last paragraph of page 10 and the associated block 320 in Fig. 3, this step is performed by checking the main SPC chart creation key, which may comprise tool, recipe, measurement field, and measurement item data.

Examiner asserts that Shi discloses such step in column 16, lines 16-32, which is reproduced below:

Another embodiment of the present disclosure that may facilitate trend analysis is a data history reconstruction feature. The results of a history reconstruction operation are presented via the chart client subsystem by a common, graphical user interface (Internet or other network interface). Trends from past data may be imported and viewed for trend analysis. Analysis charts may be used to, for example, recalculate control limits. A viewer may select to change plotting parameters and change grouping of data for display to investigate a "theoretical" new limit, tolerance, or other parameter of interest. These changes are not permanent, and are not sent to the database for recording because the changes are for problem analysis/solving and trialing purposes. Viewers may print these variously changed charts either to a file, or to a printer as a means of preserving the trials, if desired.

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Even "changes" is mentioned in the above paragraph, Shi does not specifically disclose determining whether the changed information is describable by the SPC control charts, as claimed. Applicants therefore respectfully submit that Shi lacks the claimed limitation, and there is no sufficient disclosure in Shi regarding this aspect. It is too speculative a leap to conclude that Shi anticipates the claimed invention.

II.

With respect to another aspect of the claimed invention, at least one of the SPC control charts is "updat[ed] ... with the changed information ..., upon a determination that the changed information is describable" by the SPC control charts. Examiner asserts that Shi discloses such step in column 4, lines 5-22 and Fig. 8, which are reproduced below:

The method facilitates decision support by allowing real-time monitoring of equipment performance during the various stages of a fabrication cycle by providing a chart client to allow, via graphical user interface, display of up to four charts per screen preview area, in a "web browser" (i.e., HTTP client program) window, via an Internet interface. In one embodiment, the chart may also be accessible without a web browser. Charts created with the method as disclosed permit users to chart by semiconductor processing tool, metrology tool, or by a chamber within a semiconductor processing tool. By means of the chart client as embodied by the method herein, users may view, modify, and perform "what if" analyses on statistical process control (SPC) charts, both from within a fabrication facility, or outside of a fabrication facility, on a PC or Unix workstation. In addition, a "history reconstruction" feature allows detailed trend analyses, as well as a key enabler for performing "what-if" analyses.

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According to this paragraph, Shi at most mentions "modify ... on SPC charts" without further disclosing upon what condition the SPC charts are updated.

(Fig. 8, column 10, lines 13-40) Referring now to FIG. 8, a block diagram of the statistical process control (SPC) subsystem of data collection and process control system 501 (FIGS. 5A-5B) according to an embodiment of the present disclosure, is presented. The statistical process control (SPC) subsystem, which includes SPC controller 807, and SPC procedure 810, is the heart of the data collection and process control system in the various embodiments as disclosed herein. SPC is responsible for performing calculations to generate statistics on collected data, applying rules to the statistics, and executing error actions when those rules are violated, and is supported through underlying transaction and performance monitoring system component 815. The SPC procedure 810 is a statistical engine that performs what the process control strategy 884 describes. A process control strategy (PCS) 884 is an SPC configuration mechanism that defines the context at which to pull data from the database (i.e., the process to be controlled), the data to be used to calculate the statistical points (what data should be analyzed), how the data is processed and interpreted for SPC, and actions to take based upon the interpreted data (the rules to apply and the actions to be taken when rules are violated). There is one SPC procedure 810 for each PCS 884. The PCS 884 is one of the versioned documents maintained within the transaction and processing system versioned document area 825. Other application programming interfaces in support of versioned documents 825 are workflow 838, and a web user interface (UI) 819.

The above paragraph is exclusively directed to "performing calculations to generate statistics on collected data, applying rules to the statistics, and executing error actions," which is nothing to do with updating the changed information, upon a determination that the changed information is describable by the SPC control charts, as claimed.

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Accordingly, Shi does not specifically disclose updating the changed information, upon a determination that the changed information is describable by the SPC control charts, as claimed. Applicants therefore respectfully submit that Shi lacks the claimed limitation, and there is no sufficient disclosure in Shi regarding this aspect. It is not proper to conclude that Shi anticipates the claimed invention.

III.

With respect to a further aspect of the claimed invention, a new control chart is "creat[ed] ...that can describe the changed information ..., upon a determination that the changed information cannot be described" by the SPC control charts. Examiner asserts that Shi discloses such step in column 16, lines 16-31 and Fig. 9, which is reproduced below:

Another embodiment of the present disclosure that may facilitate trend analysis is a data history reconstruction feature. The results of a history reconstruction operation are presented via the chart client subsystem by a common, graphical user interface (Internet or other network interface). Trends from past data may be imported and viewed for trend analysis. Analysis charts may be used to, for example, recalculate control limits. A viewer may select to change plotting parameters and change grouping of data for display to investigate a "theoretical" new limit, tolerance, or other parameter of interest. These changes are not permanent, and are not sent to the database for recording because the changes are for problem analysis/solving and trialing purposes. Viewers may print these variously changed charts either to a file, or to a printer as a means of preserving the trials. If desired.

Throughout the above paragraph, Applicants could not find out any sentence that discloses or mentions creating a new control chart

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that can describe the changed information, as claimed.

(Fig. 9, column 11 line 60 to column 12 line 21) An overview of the process control system PCS process according to an embodiment of the present disclosure is presented as a flow diagram in FIG. 9. In the setup phase of the operation, a process engineer creates a process control strategy (PCS) version as in step 905. The PCS defines what data from the process control system OLTP database goes into the SPC procedure when the SPC procedure is invoked. This assumes that the data has been collected and is in the database. If the desired data has not been collected, as seen in step 907, then the EDC of the process control system as disclosed herein is used to configure data for collection via a DCCS and DCP, as in step 909. However, the embodied process control system data collection configuration is not a requirement, and data collection may be configured by other means that do not involve DCCSs and DCPs. Thus, there need not be a direct relationship between the PCS and the DCP or DCCS. After data collection has been accomplished, in the execution phase of the PCS process, the process control system data matching PCS-specified context is processed according to the Pipeline Specification in step 911. In step 912, process data is interpreted according to the Control Specification, and the actions defined in the Control Specification are taken. The statistical points generated by the SPC procedure are stored in the OLTP database in step 913. The user plots and views these statistical points using the chart client in step 914. Statistical process control charts may be accessible by means of the Internet or another network, and may be presented via a graphical user interface in various formats such as wafer maps, histograms, scatter plots, bar chart, line graphs, and the like.

The above paragraph mentions how the SPC charts are accessed and presented, but never disclosing creating a new control chart that can describe the changed information, upon a determination that the changed information cannot be described by the SPC control charts, as claimed. Accordingly, Applicants respectfully submit that Shi lacks the claimed limitation, and there is not sufficient disclosure in Shi regarding this aspect. It is not proper to conclude that Shi anticipates the claimed invention.

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IV.

With respect to a further aspect of the claimed invention, it is "determin[ed] whether the new control chart is a new trend chart, which is a control chart that has not been previously used on tools of a type that is associated with the new control chart" as claimed. Specifically, as illustrated in the embodiment in the second paragraph of page 11 and the associated block 335 in Fig. 3, if, for example, the new control chart has not been previously used by a similar or same tool type, then the new control chart is a new trend chart.

Examiner asserts that Shi discloses such step in column 17, lines 31-48 and Fig. 17, which are reproduced below:

For example, if the group by attribute for Mean FICD 1706 is changed to Product (not shown) in the Group By drop down menu 1715 associated with Mean FICD 1706, the group by attribute for StdDev FICD 1707 and Normalized FICD 1708 will automatically be changed to Product because all three statistics are linked by having their respective Linked checkboxes 1710 checked, as illustrated in FIG. 17. A user selects from the Group By drop down menus 1715 to change an attribute on which grouping is based. Examples of some choices available from the Group By drop down menus 1715 may include lot, product, recipe, or operation. A user selects from the Order By drop down menus 1720 to change an attribute on which ordering is based. Examples of some choices from Order By drop down menus 1720 may include processing time at some prior context, metrology time, or lot number. The Go button 1725 is selected to regenerate the graphs and display the new grouped and/or ordered chart. To cancel the operation, the user selects the Cancel button 1730.

The above paragraph and associated figure are exclusively directed to regrouping and reordering for displaying a chart, which is

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not related with the determination for a new trend chart in the claimed invention.

Accordingly, Shi does not specifically disclose determining whether the new control chart is a new trend chart, which is a control chart that has not been previously used on tools of a type that is associated with the new control chart, as claimed. Applicants therefore respectfully submit that Shi lacks the claimed limitation, and there is no sufficient disclosure in Shi regarding this aspect. It is too speculative a leap to conclude that Shi anticipates the claimed invention.

For the foregoing reasons, as Shi lacks the claimed limitations or steps, it is respectfully submitted that the claimed invention is not anticipated by, and further patentable over, the cited prior art Shi.

With respect to another independent Claim 21, Applicants respectfully traverse the rejection on the same rationale discussed above.

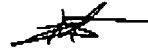
With respect to dependent claims not specifically mentioned, it is submitted that these claims are patentable not only by virtue of their dependency on their respective base claims, but also for the totality of features recited therein.

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CONCLUSION

In light of the above amendments and remarks, Applicants respectfully submit that Claims 1-4, 7-21 and 23 as currently presented are in condition for allowance. Accordingly, reconsideration is respectfully requested.

Respectfully submitted,



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